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ABSTRACT

Evidence presented by psychologists has indicated that perceptual development results in part from learned experience and may be modified to varying degrees by social pressure. Since vision is a primary source of perceptual information for art education, this study sought to determine the effects of prophecy, or expectation, on perceptual response utilizing a sampling of 117 college students. Three experimental groups received contrasting types of prophecy predictions. A fourth group served as a control. Prophecy exposure displaying interest/disinterest and authoritative prediction yielded significant performance differences as measured by perceptual differentiation tasks. The results seem to indicate that teacher attitude and expectation may be an important factor in classroom performances where perceptual factors are present. The overt behavior exhibited by teachers in influencing art production and self-expectation of students appears to be a contributing factor in visual response. (Author)

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PROPHECY AS A PERCEPTUAL AFFECTOR

Rex E. Dorethy

PROBLEM

Evidence presented by psychologists has indicated that perceptual development results at least in part from learning. The evidence also suggests that individual differences in the ability to handle visual information may also be a direct result of contributions from the learning experience. While Asch¹ and others have demonstrated that an individual's response to visual stimuli may be modified to varying degrees by social pressure, few, if any, art education researchers have investigated the effects of prophecy or expectation on perceptual style or situations where visual perception is said to be taught. Expectation, in this instance, is experimentally defined as operations whereby display of interest/disinterest behavior or authoritative predictions regarding subjects'

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success imply a self-fulfilling prophecy.

There is ample evidence that perceptual judgments can be affected by training.² In addition, studies by Salome³, Efland⁴, Rennels⁵, Dorethy⁶, and others suggest that formal perceptual training strategies hold relevance for performance in the visual arts. Would it be possible, therefore, to affect perceptual learning through the display of expectation behavior? Does such behavior tend to modify the visual/productive skills of artists? What would be the comparative effects of interest and disinterest display upon tests measuring perceptual ability? The answers to these and other questions need specific research. The basic aim of this exploratory study was to investigate the effects of examiner (or teacher) expectancy on performance over perception tasks related to the visual arts.

The cumulative effect of previous art education studies in perceptual training has been to explicate the results of treatment on a group of subjects while striving to maintain the conditions of neutrality and equality essential to experimental research. The technical difficulties and requirements

of scientific research, however, often receive scant attention in classroom practice, where many uncontrolled variables may exert influences on learning. The expectations of the teacher, conveyed by a smile, a glance, critical comments, or other relations between student and instructor, may occur and affect artistic action in the classroom. Since accountability for teacher action is a current concern, and evaluation is becoming increasingly important, investigation of factors relating to classroom performance would seem an important area for art education research.

Studies in psychology and education have indicated that attitudes toward learners may be affectors for behavior, with the expectations of both student and teacher tending to serve as a self-fulfilling prophecy. These studies suggest that stress related to race, sex, age, class, or anticipated outcomes of learning may affect cognitive functioning, IQ test performance or school achievement. Canady⁷, Watson⁸, Katz and others⁹ have indicated that IQ scores with black students tended to fluctuate significantly when subjects were presented with examiners alternating in race, with

information regarding the purpose of the testing, and with threat (not carried out) of shock. Knowledge of how the test results were to be analyzed, groups to which scores were to be compared, and predictions regarding likelihood of successful performance also affected the IQ achievements of subjects.¹⁰ The subjects appeared to conform to predictions, although no evidence actually existed for the expectations.

Katz and Benjamin¹¹ also found that black subjects tended to rate themselves much lower than white subjects following testing sessions in which both races had achieved equally well, indicating invalid feelings of inferiority. Watson conducted studies in Great Britain with similar results, indicating the phenomenon to be widespread and not distinct to the United States.¹² These studies also indicated race related expectation levels to be a factor in test performance regardless of age, but becoming more of a factor with increasing age. Similarly, research conducted in mathematics performance at the U.S.A.F.

Academy suggests the phenomena is neither age nor race restricted since subjects randomly assigned to high and low ability groupings tended to score higher when they were told they were being assigned to the high ability groups.¹³

Marwit and Marcia tested the hypothesis that number of responses to a series of ink-blots was a function of examiner's expectation.¹⁴ Examiners prophesying greater responses obtained fifty-four per cent more than the examiners prophesying fewer responses. A study by Sacks¹⁵ and another by Gordon and Durea indicated IQ gains of from six to ten points when children were treated warmly than when examiners behaved more coolly toward the subjects.¹⁶ Rosenthal and Jacobson, while achieving controversial results regarding variable control, indicated substantial results when baseless predictions of success for some students were made to their teachers (who were unaware that no real evidence existed for the predicted IQ gains).¹⁷

The Hypotheses: The construct of expectation as a self-fulfilling prophecy provided the

basis for hypothesizing that: (1) Subjects exposed to examiner interest would display greater differentiation ability as measured by the Maccoby-Rau Embedded-Figure-Test (EFT)¹⁸ than similar subjects provided with disinterest behavior. (2) Positive authoritative predictions of success would affect increased scores on subject's EFT performance as compared to the scores of subjects receiving a negative prediction, and (3) that display of positive authority behavior would affect increased EFT scores when treated subjects were compared to a control group. The accompanying null hypotheses were tested at the .05 level of confidence.

PROCEDURES

Subjects: The sample was obtained by random selection of 117 white female undergraduate students enrolled in general art education classes at Illinois State University, utilizing a table of random numbers. Twenty students were then randomly assigned to Experiment I, 38 to Experiment II, 40 to Experiment III, and 19 subjects made up the control group.

The experiment was of six weeks duration during the fall semester of 1971. The selection of female students was made due to the nature of the population from which the groups were obtained, and seemed justified on the basis of Witkin's identification of sex differences in perceptual style.¹⁹

Treatments and Testing: Three experiments were designed to test the hypothesized differences. Experiment I sought to determine what effects interest and encouragement display versus disinterest and lack of encouragement would have on perceptual ability as measured by the EFT. Examiners who expressed viewpoints compatible with these conditions were deliberately selected, operated independently and without knowledge of each other, and alternated in administering either the odd or even numbered test items. The interested examiner (IE) displayed interest and privately predicted subject success, while the disinterested examiner (DE) predicted failure, suggesting that the particular subjects involved would experience

difficulty with the test tasks. In an attempt to enhance the prophecy or expectancy exhibited by each examiner, the interested examiner was told that due to prior test results his test subjects might be expected to excel in the perception tests, while an exactly opposite situation was expressed to the disinterested examiner. In actuality, both groups were one and the same, and no real evidence of this ability prediction was on hand. Two different examiners simply administered a series of related test items on a one-to-one basis to the same group of subjects by utilizing identical testing directions. Hidden tape recorders were utilized to record and analyze the individual test situations.

Experiment II utilized the same interest/disinterest treatment as Experiment I, except that a different pair of examiners administered the EFT, on a group basis, each examiner testing a different group. The aim of this treatment was to determine if the less personal group testing would be effective.

Experiment III involved the use of author-

itative predictions, in the form of comparative test results established by researchers, which were read beforehand to the groups during a lecture/discussion period concerning perception in art education. No such results actually existed, the examiner merely pretended to read statistical findings from a test manual prior to testing. One group received a positive prediction concerning the students in their respective field, and the second group received indication that education majors ranked lowest when test results were compared to students in other discipline areas. This experiment also utilized an untreated control group for comparative purposes.

Instrumentation: The Maccoby-Rau group adaptation of H. A. Witkin's Embedded Figure Test (EFT) was selected for use in this study because the EFT instruments for analyzing perceptual differentiation are well researched and documented.²⁰ The EFT is an assigned time test concerned with modes of handling incoming visual data, and its variations are

commonly used in art education studies of perceptual training. The test booklet used in the experiment contained twenty-two embedded figure items. Test-retest reliability for this instrument has been established at .92 for a one-week interval, and .89 for a one-year interval.

RESULTS

Analysis of Data: The study design, hypotheses, and the computer assisted statistical analyses focused attention on the operation of the independent variable, examiner expectation. The Embedded Figure Test was administered subsequent to each of the three experiments to investigate the hypotheses suggesting that display of interest/prediction would affect the degree of differentiation in subjects' ability to locate simple figures in a complex design. Analysis of variance and t-tests were conducted using EFT scores to determine if significant differences existed between groups. The F-ratio and analysis of variance data is reported in Table 1.

TABLE 1

EFT ANALYSIS OF VARIANCE SUMMARY
FOR EXAMINER EXPECTATION DATA WITH
SIX GROUPS OF EXPERIMENTAL SUBJECTS

Source of variance	Sum of squares	Degrees of freedom	Mean squares	F- ratio
Group	6667.008	6	1111.168	18.02831*
Within	7950.867	129	61.635	
Total	14617.875	135		

(*) $< .05$

The F-ratio of 18.02831 for EFT scores was significant at well beyond the .05 level of confidence, indicating differences in group performance as measured by the dependent variable.

The analysis of variance program also generated a t-test analysis to further explore and isolate the between group differences. The t-values and data for this analysis are reported in Table 2.

TABLE 2

t-TEST ANALYSIS OF EFT MEANS FOR
COMPARISONS OF EXAMINER EXPECTATION
IN EXPERIMENTAL GROUP 1, EXPERIMENTAL
GROUPS 3 AND 4, 5 AND 6, AND WITH
CONTROL GROUP 7

Source	Degrees of freedom	t	Significance levels
<u>Experiment I</u>			
Group 1 (IE) and Group 1 (DE)	19	2.447	<.05
<u>Experiment II</u>			
Group 2 (IE) and Group 3 (DE)	36	2.065	<.05
<u>Experiment III</u>			
Group 4 (PA) and Group 5 (NA)	38	2.709	<.05
Group 4 (PA) and Group 6 (Control)	38	1.274	N.S.

The difference between post-test means from interested examiner (IE) treated subjects and disinterested examiner (DE) treated subjects in Experiment I was significant at

beyond the .05 level of confidence, indicating that the IE treated subjects performed at a higher level as measured by the EFT. The differences between post-test means of IE subjects and DE subjects in the group treatment of Experiment II was also significant at beyond the .05 level, suggesting a higher level of perceptual performance when the interest variable was present. The t -value generated for EFT performance between Group 4 and Group 5, where positive (PA) and negative (NA) authority was displayed in Experiment III, was also significant at beyond the .05 level of confidence, again indicating higher performance for the group receiving a positive encouragement prediction. The difference between means for Group 4 and the Control Group in Experiment III did not reach the .05 alpha level and was not significant. The null hypothesis was retained in this latter instance as the data proved inconclusive.

CONCLUSIONS AND DISCUSSION

Conclusions: Based on data obtained from the three experiments, and pending further investigation, the following conclusions are suggested:

(1) Examiner expectation which emphasizes interest display did affect perceptual differentiation in embedded figure tasks with female college students, under the conditions of this study.

(2) Presentation of positive and authoritarian predictions regarding chance of success appeared to be a significant factor in explaining the perceptual differences measured in the third experiment, where comparisons were made with subjects receiving a negative prediction for perceptual ability.

(3) Prediction of success in perception-related tasks was not a significant factor when positive prediction subjects were compared with similar subjects who were treated neutrally.

Discussion: This pilot investigation was an attempt to obtain evidence which would help determine if examiner expectation would

change in a positive direction the ability of college students to analyze visual data. The ultimate purpose of the study was to establish direction in examination of prophecy effects on art learning situations. Analysis of variance data indicated that students operating under high interest/expectation conditions scored significantly higher than similar students presented a situation displaying low interest and expectation on the part of a test examiner. The reasons for these results are open to conjecture, but the implications may be important for art education. No detrimental effects to the reliability of the EFT tasks were suggested, since control group comparisons were lacking in conclusive data. Similarly, information gained from analyzing tape recordings of the test sessions was also inconclusive, since no obvious differences in examiner presentation could be noticed. On the other hand, both group and one-to-one presentations produced results, indicating variable presence.

The lack of effectiveness for the disinterested examiners may in part have been due to the subjects' identifying the attitude display with the general neutrality shown by test administrators in typical classroom situations. The superior effects of the interested examiners results may result from aroused interest through the continued use of encouragement statements, warmth, and personal interest displayed in an overt manner. Perhaps more important, however, is the possibility that encouragement behavior such as that of the interested examiner may encourage the more open ended, failure-free atmosphere often referred to in descriptions of the conditions required for creative behavior. If a divergent approach to the solution of the visual tasks encountered in the EFT is encouraged by examiner interest, this rewarding behavior may result in free exploration of diverse strategies and facilitate discrimination even during the short course of the examination. The more typical (of education) success/failure approach displayed by the low interest

situation may result in hesitation and fear of exploration on the part of the subject. Such may also be the case in art learning situations.

Better isolation of the independent variables should be a major goal of future studies. The overt behavior exhibited by teachers in influencing art production and self-expectation of students should be examined. If expectancy can influence performance gains under testing conditions, the extent of prophecy influence on classroom performance may develop as an important area of study.

To draw firm conclusions from the findings, a great deal more would have to be known about other conditions and relationships affecting the performance of students under prophecy conditions. It seems evident that further research should be conducted in this aspect of art education.

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